

REMARKS

In the Office Action, the Examiner rejected claims 1-3, 6-16, 20-22, 24, 25, 27-36, 39-41, and 43-52. By this paper, Applicants amended claims 1, 15, and 25 to resolve both a claim objection and the rejection under 35 U.S.C. § 112 to place the present application in condition for allowance or appeal. Also, it should be noted that a new search or examination is not necessitated by the present amendments. Applicants respectfully request the Examiner enter the present amendments. Claims 1-3, 6-16, 20-22, 24, 25, 27-36, 39-41, and 43-52 remain pending in the present application and are believed to be in condition for allowance. Applicants respectfully request reconsideration and allowance of all pending claims.

Claim Amendments

Claim 1 is amended, as suggested by the Examiner, to resolve the objection to claim 1. Further, to resolve the present rejection under § 112, claims 1, 15, and 25 are amended to remove the phrase “as vapor” to return these claims to their previous form prior to the amendment made in the last Response. *See Response to Office Action mailed June 14, 2007 (amending claims 1, 15, and 25 to add the phrase “as vapor”). Again, because the current amendments resolve a claim objection and also resolve rejections under § 112 to place the application in condition for allowance or appeal, and because no new search is necessitated by these amendments, Applicants respectfully request the Examiner enter the present amendments.*

Claim Objections

In the Office Action, the Examiner objected to claim 1 due to an informality. Applicants have amended claim 1 as set forth above. In view of this amendment, Applicants respectfully request the Examiner withdraw the objection to the claims.

Claim Rejections under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 1-3, 6-16, 20-22, 24, 25, 27-35, 44, 45, and 52 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement. Although Applicants do not necessarily agree with the Examiner’s position, Applicants have amended independent claims 1, 15, and 25 as set for above. In view of

these amendments, Applicants respectfully request the Examiner withdraw the rejection under 35 U.S.C. § 112.

Claim Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claims 1, 2, 6, 7, 9-14, 25, 27, 29-35, 50, and 51 under 35 U.S.C. § 103(a) as obvious over Rosenbaum et al. (U.S. Patent No. 3,816,379) in view of Sherk et al. (U.S. Patent No. 4,501,885); claims 3 and 44 as obvious over Rosenbaum in view of Sherk and Sung (U.S. Patent No. 5,314,579); claims 8 and 28 as obvious over Rosenbaum in view of Sherk and Findlay (U.S. Patent No. 3,035,040); claims 15, 16, 20, 22, 24, and 45 as obvious over Rosenbaum in view of Hanson (U.S. Patent No. 5,597,892) and Sung; claim 21 as obvious over Rosenbaum in view of Hanson, Sung, and Findlay; claims 36, 39, 41, 43, and 47 as obvious over Rosenbaum in view of Hanson; claim 40 as obvious over Rosenbaum in view of Hanson and Findlay; claims 46 and 49 as obvious over Rosnbaum; claim 48 as obvious over Rosenbaum in view of Findlay; and claim 52 as obvious over Rosenbaum in view of Hanson. Of these, claims 1, 15, 25, 36, and 46 are independent. Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness under 35 U.S.C. § 103 falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case of obviousness, the Examiner must show that the combination includes *all* of the claimed elements, and also a convincing line of

reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Further, the Supreme Court has recently stated that the obviousness analysis should be explicit. *See KSR Int'l Co. v. Teleflex, Inc.*, 82 U.S.P.Q.2d 1385 (U.S. 2007) ("[R]ejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.") (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation (or require substantial redesign) of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

Deficiencies of the Rejection of Independent Claim 1

Amended independent claim 1 recites, *inter alia*, “transferring the solid polymer particles from the intermediate pressure zone to a purge zone in which a purge gas is passed through the solid polymer particles to remove entrained hydrocarbon fluid, thereby forming a mixed stream containing hydrocarbon vapor and purge gas; transferring the mixed stream to a recovery zone where the purge gas and hydrocarbon fluid are separated to form a recovered purge gas stream and a recovered hydrocarbon fluid stream; [and] passing at least a first portion of the recovered purge gas stream from the recovery zone to the purge zone.” (Emphasis added).

As denoted above, the Examiner rejected independent claim 1 as obvious over Rosenbaum in view of Sherk. However, these references are improperly combined as they teach different principles of operation. The Rosenbaum reference utilizes steam to separate heavies from a polymer slurry. *See* Rosenbaum, col. 6, lines 35-48. The steam is then separated from the heavies via condensation into water. *See* Rosenbaum, col. 6, lines 44-54. In the rejection of claim 1, the Examiner stated:

Rosenbaum et al. is silent as to the use of a different purge gas for removing the residual hydrocarbon entrained in the polymer solids, e.g., a non-condensable purge gas, such that the separation of the purge gas from the residual hydrocarbon involves the separation of a gas phase (and not a liquid, water phase) from the residual hydrocarbon in the recovery zone.

Final Office Action, pages 5-6.

The Examiner then modified the teachings of Rosenbaum to incorporate the teachings of Sherk because Sherk discloses use of a purge gas such as nitrogen. *See* Sherk, col. 2, lines 29-31. However, the nitrogen purge gas disclosed in Sherk would not be operable in the Rosenbaum system. Specifically, Rosenbaum teaches condensation of the heavies in line 40 and removal of the purge gas as a liquid in line 43. *See* Rosenbaum, col. 6, lines 44-54. Nitrogen would not be a viable purge gas in the Rosenbaum system because it is not easily condensed and therefore would require a completely different separation system.

Furthermore, the Examiner has argued that the limitation of “passing a second portion of the recovered hydrocarbon fluid stream from the recovery zone to a recycle zone” is disclosed in the Rosenbaum reference (emphasis added). *See* Final Office Action, page 5. Specifically, the Examiner stated that this stream is conveyed “indirectly, to line 63, to line 69, 70, 71.” *Id.* However, this analysis is clearly erroneous. While the storage tank 73 in Rosenbaum may “ultimately” receive material which at one time passed through the condenser 41 and the feed drum 42, there is clearly no stream passing from the condenser 41 and/or feed drum 42 to the storage tank 73. Indeed, the only stream passing to the storage tank 73 is from the condenser 72, and the only stream entering the condenser 72 is from the first and second stage strippers 28 and 32. While the present claim does not recite a line directly connecting the recovery zone to the recycle zone, the plain meaning of the claim clearly precludes an interpretation which has

the hydrocarbon fluid stream passing through over half the devices in the polymerization and recovery system (e.g., first and second fractionators, a partial condenser, a reflux drum, a heat exchanger, first and second strippers, and a condenser) before reaching a recycle zone. As such, the primary reference clearly does not disclose the present limitation, and the secondary references fail to obviate the deficiencies of the primary reference.

In view of these deficiencies, the cited references do not obviate independent claim 1 and its dependent claims. For at least these reasons, among others, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Deficiencies of the Rejection of Independent Claim 15

Amended independent claim 15 recites, *inter alia*, “a hydrocarbon/purge gas recovery unit adapted to separate hydrocarbon fluid from purge gas, the recovery unit fluidically connected to a top portion of the purge column and adapted to receive a fluid stream comprising purge gas and hydrocarbon fluid from the purge column; a recycle tank adapted to receive condensed hydrocarbon vapor from the condenser and to receive a second hydrocarbon fluid stream from the hydrocarbon/purge gas recovery unit; ... and an extruder feed tank adapted to receive the solid polymer particles from the purge column.” (Emphasis added).

In the Final Office Action, the Examiner rejected claim 15 as obvious over Rosenbaum in view of Hanson and Sung. Specifically, the Examiner modified the teachings of Rosenbaum to incorporate a pump from Hanson and an extruder feed tank from Sung and stated that the remaining limitations can be found in Rosenbaum. *See* Final Office Action, pages 10-11. As discussed above, the Rosenbaum reference fails to disclose a recovery unit which separates hydrocarbon fluid and purge gas. Rather, the cited reference removes liquid water 43 from the heavies stream 40. *See* Rosenbaum, col. 6, lines 44-54. The Examiner did not refer to another to reference to obviate this deficiency.

Additionally, the Examiner cited the powder silo 60 of Sung as an extruder feed tank as taught by the present application. *See id.* However, the powder silo 60 as described in the Sung reference actually operates as a purge column. As recited in the Sung reference, “entrained powder is fed to powder silo 60 for purging with a countercurrent flow of heated purge gas.” Sung, col. 6, lines 7-10. Accordingly, the powder silo 60 cannot be “an extruder feed tank adapted to receive the solid polymer particles from the purge column” as recited in the present claim (emphasis added).

Furthermore, similar to the issue discussed above in reference to claim 1, the Examiner argued that the limitation of “a recycle tank adapted … to receive a second hydrocarbon fluid stream from the hydrocarbon/purge gas recovery unit” is disclosed in the Rosenbaum reference. Final Office Action, page 10. The Rosenbaum reference does

not disclose the present claim element. Even if, *arguendo*, Rosenbaum teaches “indirectly” carrying a hydrocarbon fluid stream from the condenser 41 and/or feed drum 42 to the storage tank 73, which Applicants do *not* concede, the storage tank 73 is clearly *not adapted to receive first and second hydrocarbon streams*. Rather, the storage tank 73 receives only one feed stream from the condenser 72, and the condenser 72 receives only one feed stream 71 from the strippers 28 and 32. Accordingly, the primary reference clearly does not disclose the present limitation, and the secondary references fail to obviate the deficiencies of the primary reference.

In view of these deficiencies, the cited references do not obviate independent claim 15 and its dependent claims. For at least these reasons, among others, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Deficiencies of the Rejection of Independent Claim 25

Amended independent claim 25 recites, *inter alia*, “transferring the mixed stream to a recovery zone where the purge gas and hydrocarbon fluid are separated to form a recovered purge gas stream and a recovered hydrocarbon fluid stream; … [and] passing at least a portion of the recovered hydrocarbon fluid stream from the recovery zone to the recycle zone.” (Emphasis added).

Again, the Examiner rejected independent claim 25 as obvious over Rosenbaum in view of Sherk. As discussed in reference to independent claim 1, these references are

not properly combinable. Furthermore, as discussed above, the Rosenbaum reference fails to disclose forming a recovered purge gas stream. Rather, the steam used as a purge gas in the cited reference is removed as water. *See* Rosenbaum, col. 6, lines 44-54. Additionally, as the Sherk reference teaches a different principal of operation, it is not proper to combine these references.

In addition, the Rosenbaum reference fails to disclose “passing at least a portion of the recovered hydrocarbon fluid stream from the recovery zone to the recycle zone” as recited in the present claim (emphasis added). As discussed above, the Examiner’s citation of the multiple streams passing through various processors in the Rosenbaum reference clearly does not anticipate the present limitation. The plain language of passing a stream from one location to another does not include submitting the stream to countless processes along the way.

In view of these deficiencies, the cited references do not obviate independent claim 25 and its dependent claims. For at least these reasons, among others, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Deficiencies of the Rejection of Independent Claim 36

Independent claim 36 recites, *inter alia*, “a hydrocarbon/purge gas recovery unit adapted to separate hydrocarbon fluid from purge gas, wherein the recovery unit is fluidically connected to a top portion of the purge column and adapted to receive a fluid

stream comprising purge gas and hydrocarbon fluid from the purge column; [and] a recycle tank adapted to receive hydrocarbon liquid from the condenser and to receive hydrocarbon fluid from the hydrocarbon/purge gas recovery unit." (Emphasis added).

As noted above, the Examiner rejected independent claim 36 as obvious over Rosenbaum in view of Hanson. Specifically, the Examiner stated that Rosenbaum discloses all the elements of the present claim except for a loop reactor, which is taught by Hanson. *See* Final Office Action, pages 13-14. However, as discussed above, the Rosenbaum reference fails to disclose a recovery unit which separates hydrocarbon fluid from purge gas. Rather, the Rosenbaum reference discloses a condenser and feed drum which separates heavies into condensate and liquid water. *See* Rosenbaum, col. 6, lines 44-54. Furthermore, despite the Examiner's assertions to the contrary, the Rosenbaum reference does not disclose "a recycle tank adapted ... to receive hydrocarbon fluid from the hydrocarbon/purge gas recovery unit" as recited in the present claim. Even though the present claim does not recite a direct line from the recovery unit to the recycle tank, the plain meaning of the claim language precludes the Examiner's interpretation of such a remote indirect pathway via lines 44, 63, 69, 70, and 71.

In view of these deficiencies, the cited references do not obviate independent claim 36 and its dependent claims. For at least these reasons, among others, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Deficiencies of the Rejection of Independent Claim 46

Independent claim 46 recites, *inter alia*, “separating a majority of the hydrocarbon liquid from the polymer solids in the effluent by flashing the majority of the hydrocarbon liquid to generate a hydrocarbon vapor.” (Emphasis added).

The Examiner rejected independent claim 46 as obvious over Rosenbaum. In contrast to the recited limitation, the Rosenbaum reference teaches a stripper operation for separating overhead from bottoms. *See* Rosenbaum, col. 6, lines 25-34. Specifically, the first stripper operation utilizes a stripping medium of pure recycled hot diluent-solvent to separate the light overhead (i.e., unreacted monomer and diluent) from the heavy bottoms (i.e., polymer). Rosenbaum, col. 3, lines 9-11; col. 7, lines 9-16. The stripping process involves a mass transfer of the monomer and diluent from the reactor effluent to the diluent-solvent stripping medium. In contrast, the flash operation recited in the present claim separates components of the intermediate product slurry by vaporizing the liquid in the slurry. *See, e.g.*, Specification, ¶ [0035]. These processes are different and utilized different equipment, operating procedures, and so forth. Accordingly, the stripper operation disclosed in the Rosenbaum reference does not obviate the flash operation recited in the present claim.

In view of these deficiencies, the cited references do not obviate independent claim 46 and its dependent claims. For at least these reasons, among others, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Conclusion

Applicants respectfully submit that all pending claims should be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

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Floron C. Faries
Floron C. Faries
Registration No. 59,991
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289
(281) 970-4545